



# Willamette Basin Rivers & Streams Assessment



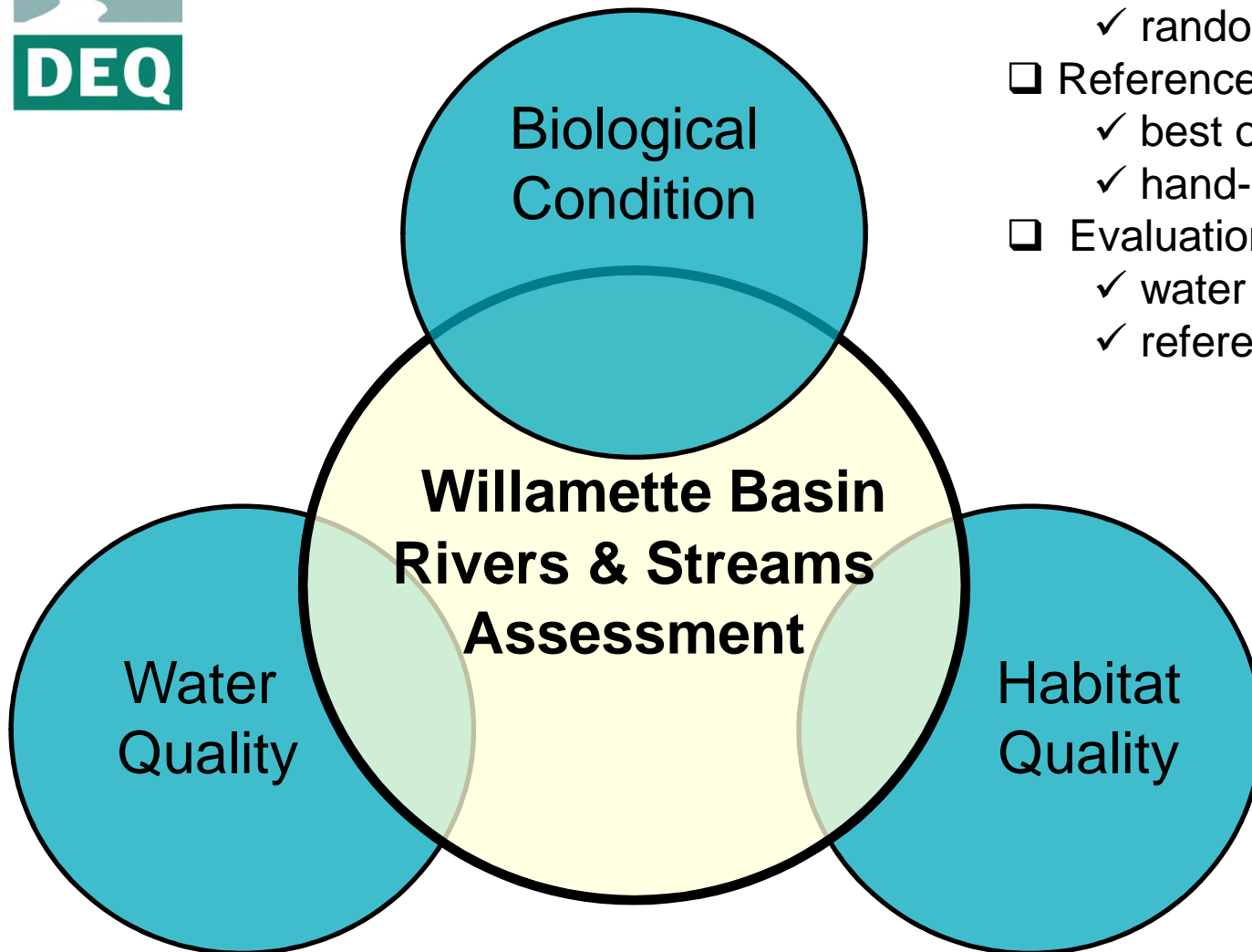
THE OREGON PLAN FOR  
*salmon & watersheds*

Michael Mulvey  
Robin Leferink  
Aaron Borisenko

NWQMC May 1, 2014



## Components



- ☐ River & stream 'poll'
  - ✓ randomly selected sites
- ☐ Reference condition sites
  - ✓ best of what's left
  - ✓ hand-picked
- ☐ Evaluation
  - ✓ water quality criteria
  - ✓ reference benchmarks



## Overview

### **Random sites and reference sites**

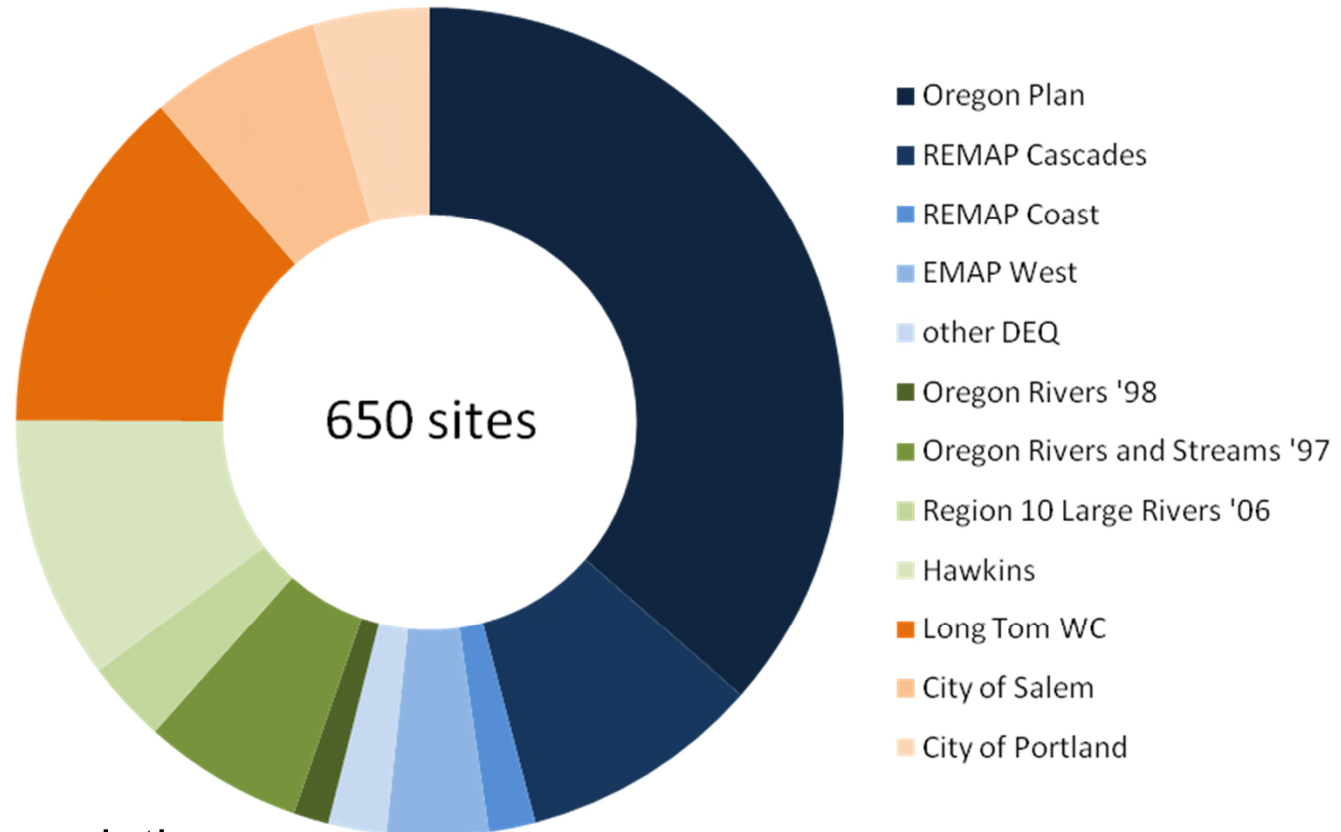
- 450 random sites
- 230 reference sites
- 15 different surveys

### **Spatial extents**

- Willamette basin
- 12 Subbasins
- 3 Major land use categories
  - 8 Minor
- Reference condition of basin and subbasins



## Data Sources



- Compatible target populations
- Random site selection
- Standardized field collection
- Compatible laboratory analysis



## Willamette Basin

### Land Use

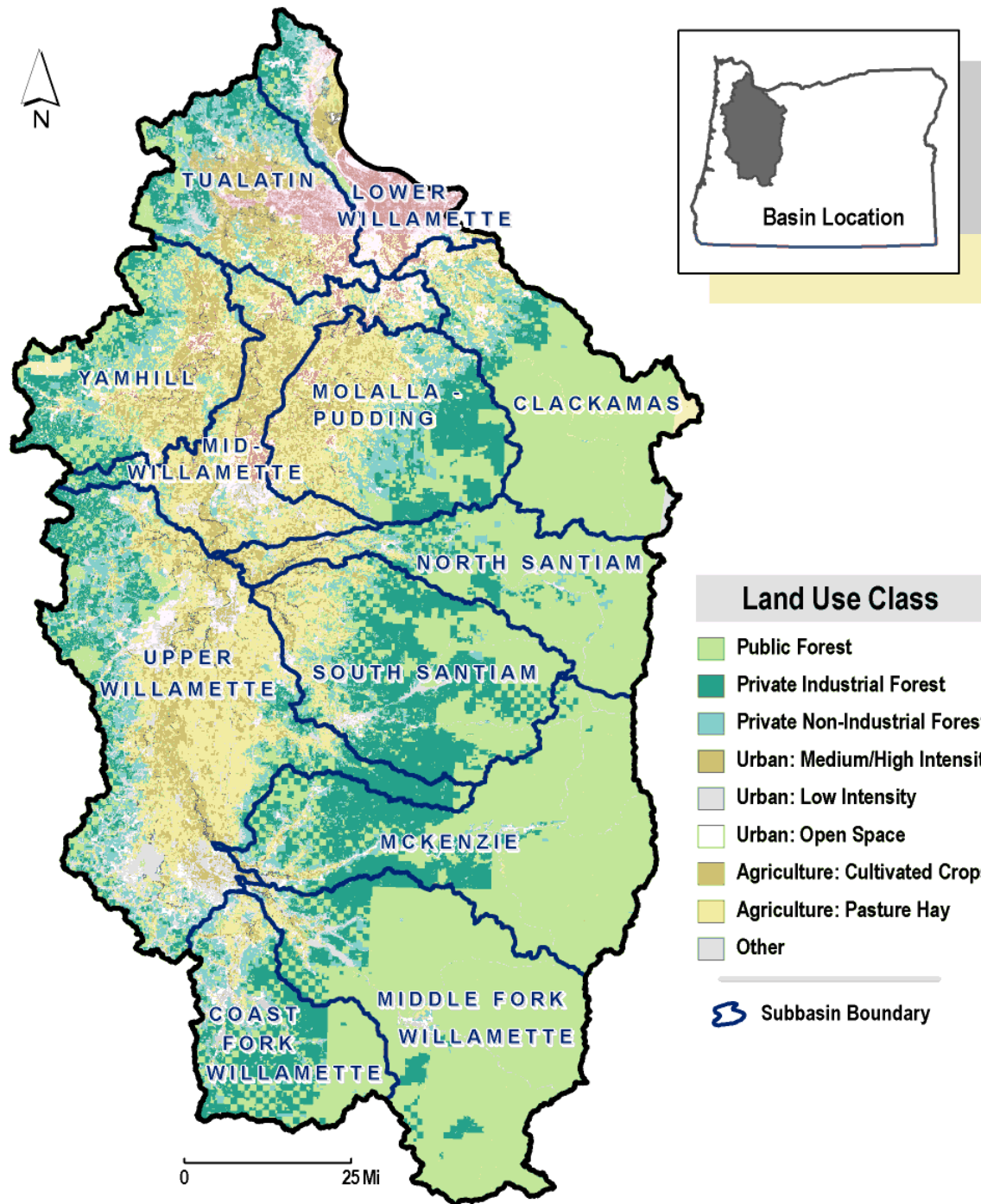
10%  
Urban

30%  
Agriculture

60%  
Forest

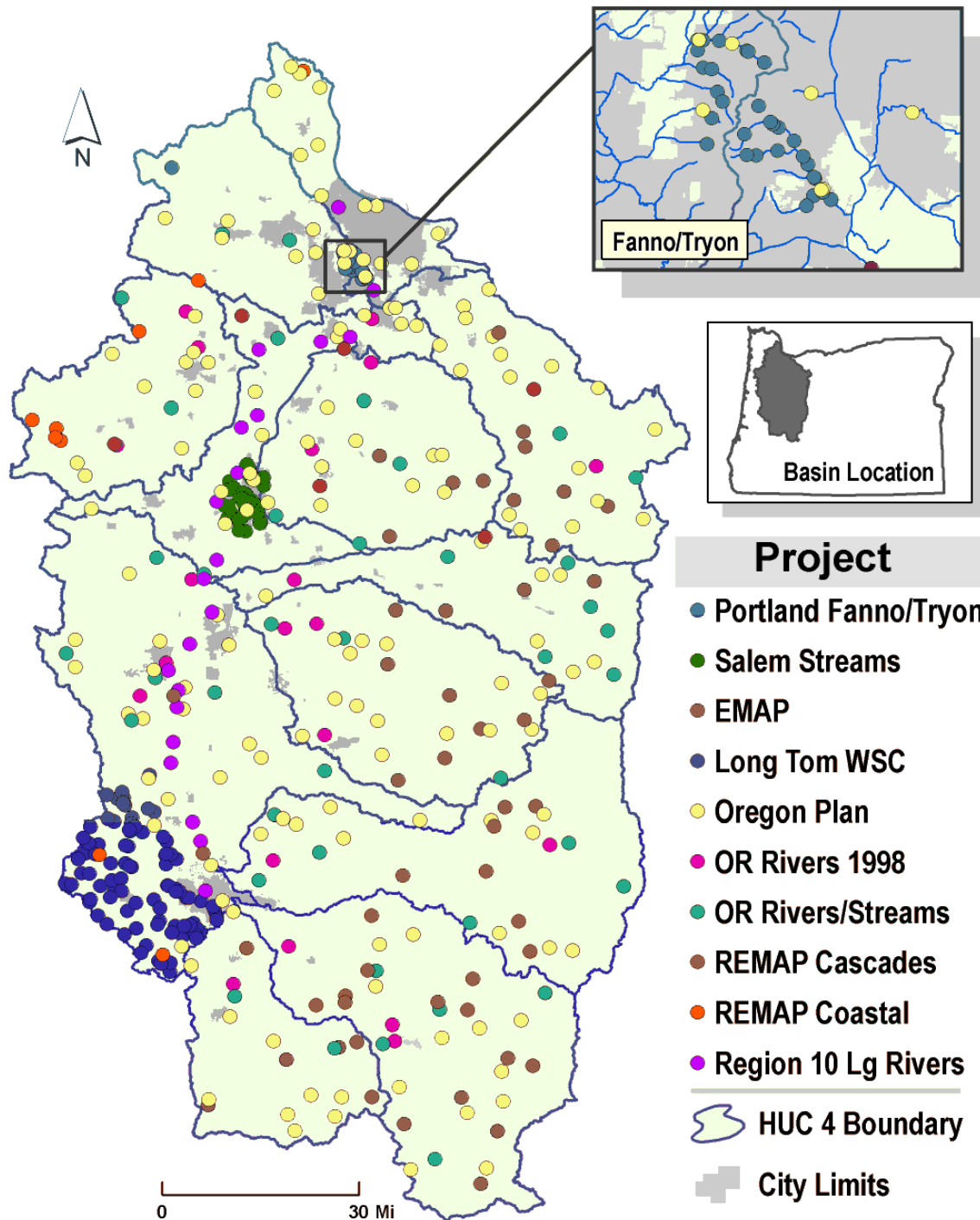
### Subbasins

(12)





Random  
Site  
Locations





Fish and Amphibians



Habitat



Bugs



Chemistry



Tualatin River



An agricultural stream



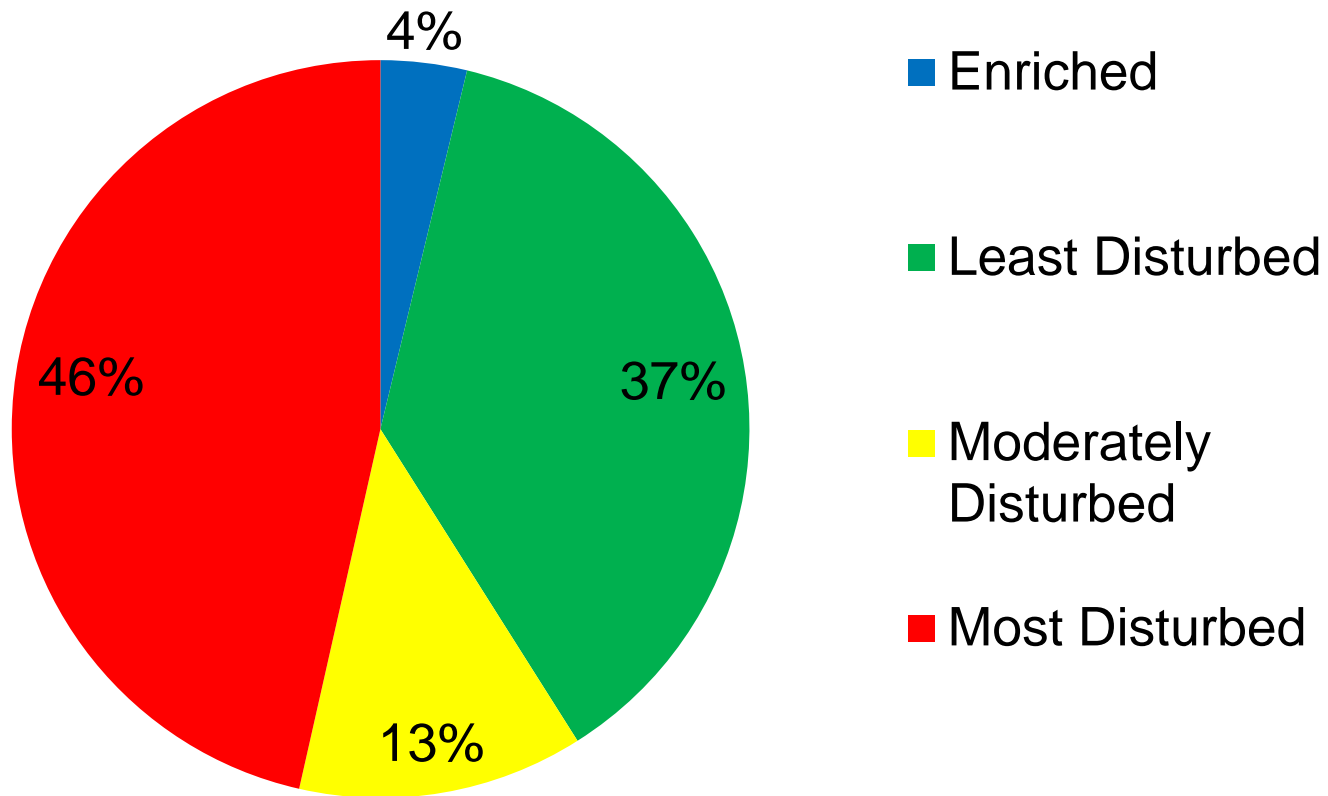
An urban stream



A forest stream

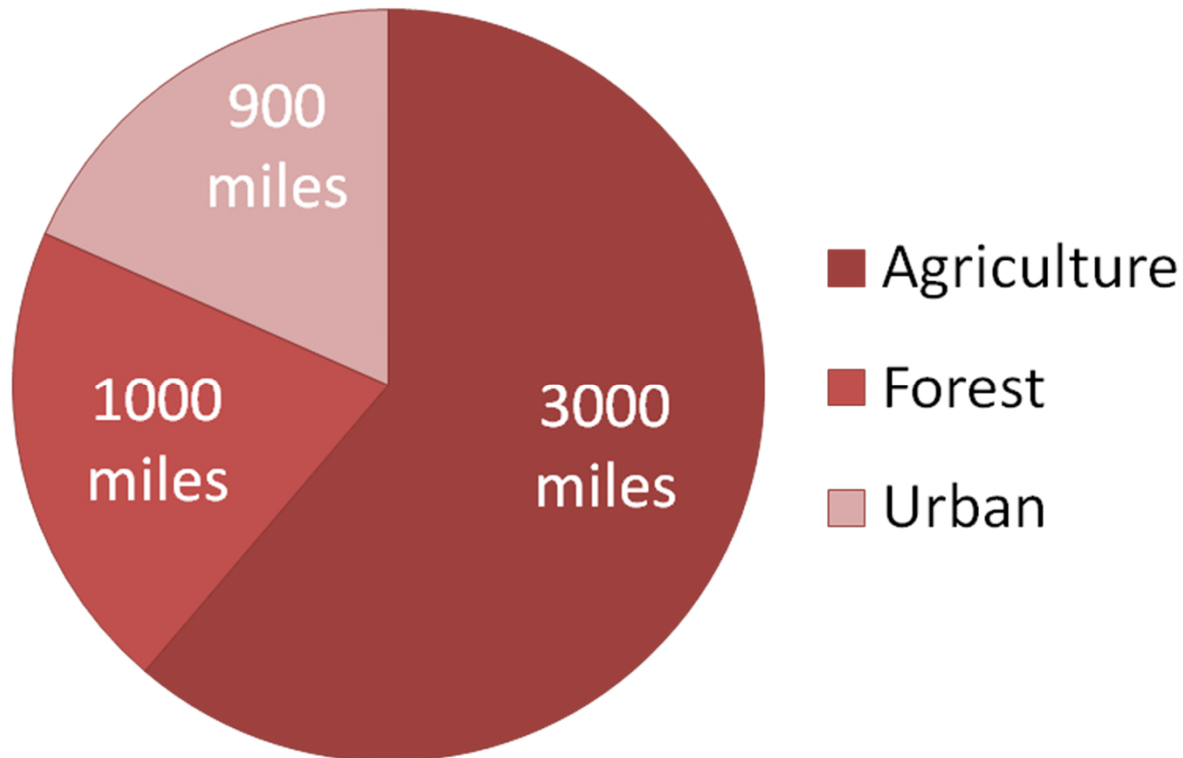


## Willamette Basin Biological Condition



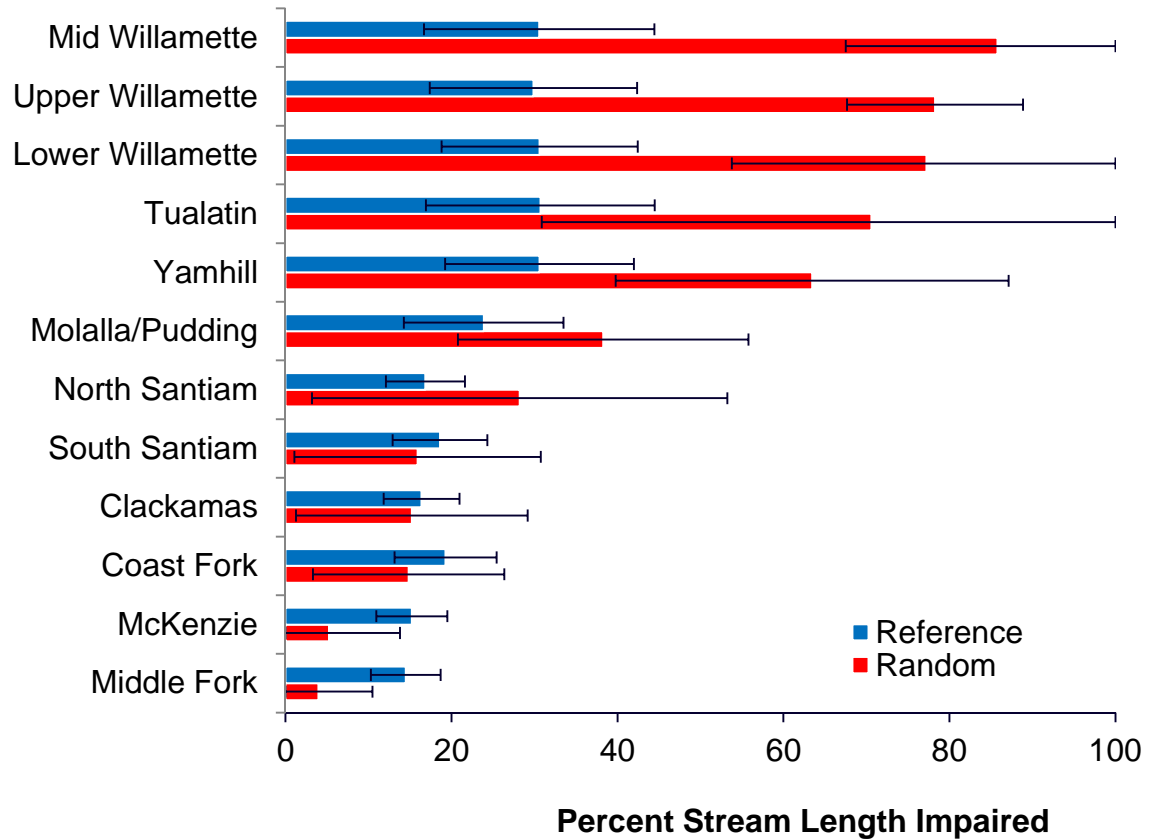


## **“Most Disturbed” Stream Miles by Land Use**



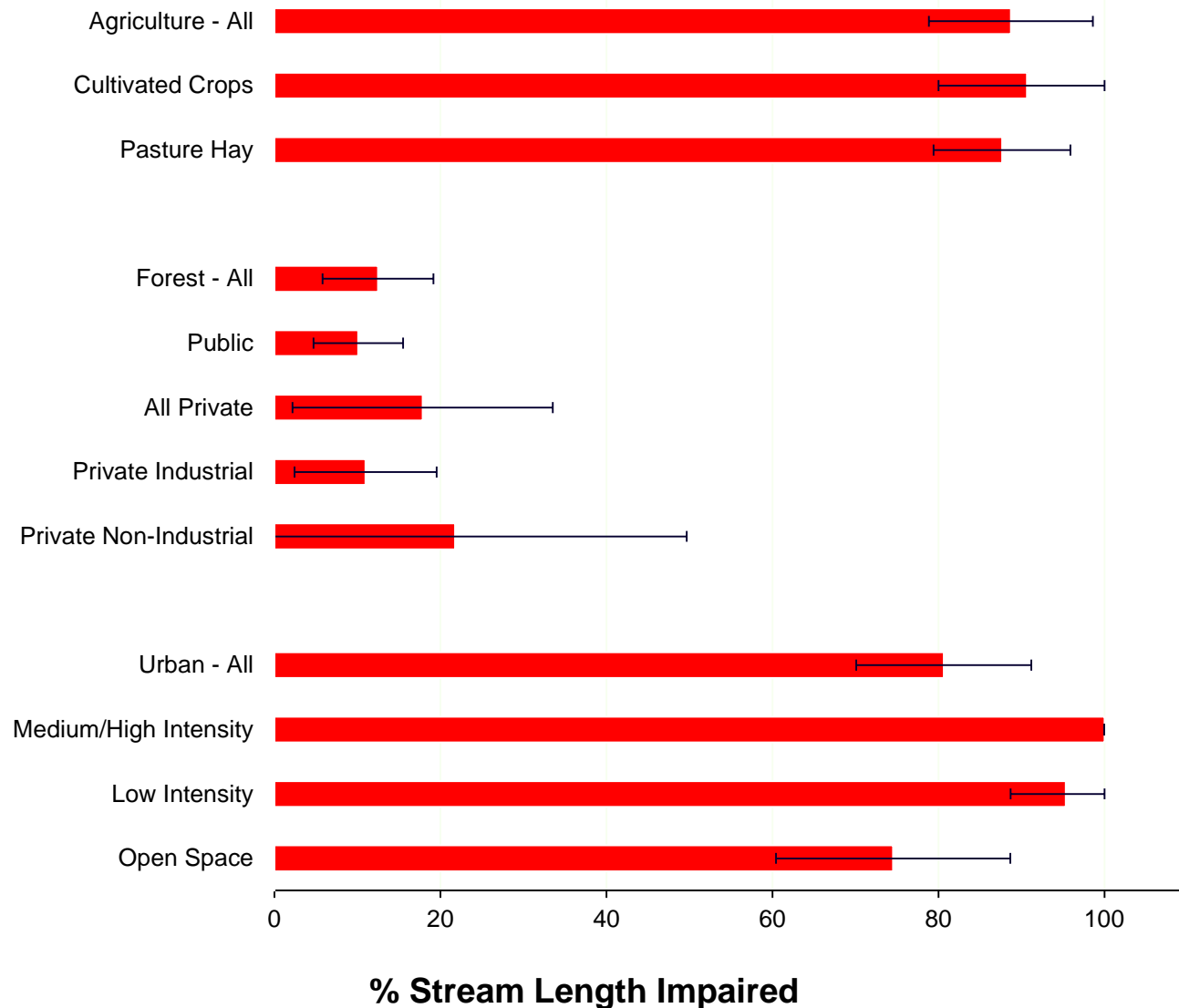


## Subbasins Conditions





## Biological Condition by Land Use

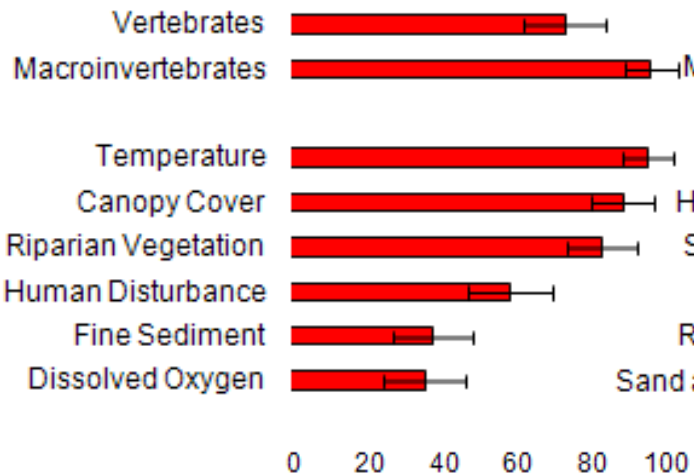


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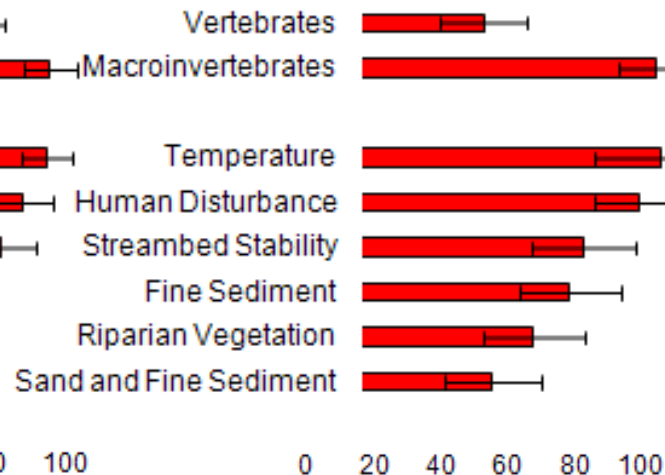


## Major Land Uses

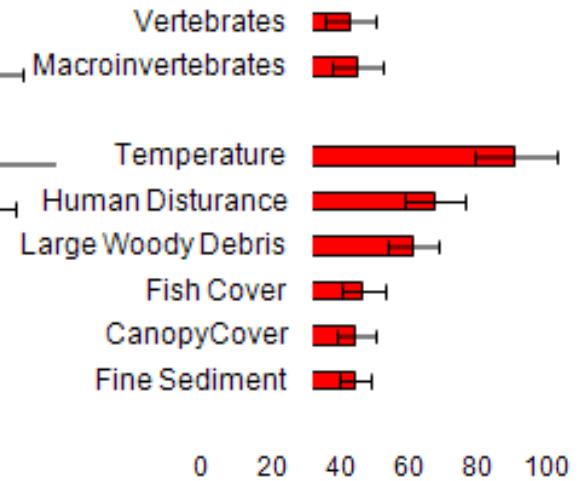
### Agricultural Impairment



### Urban Impairment



### Forest Impairment



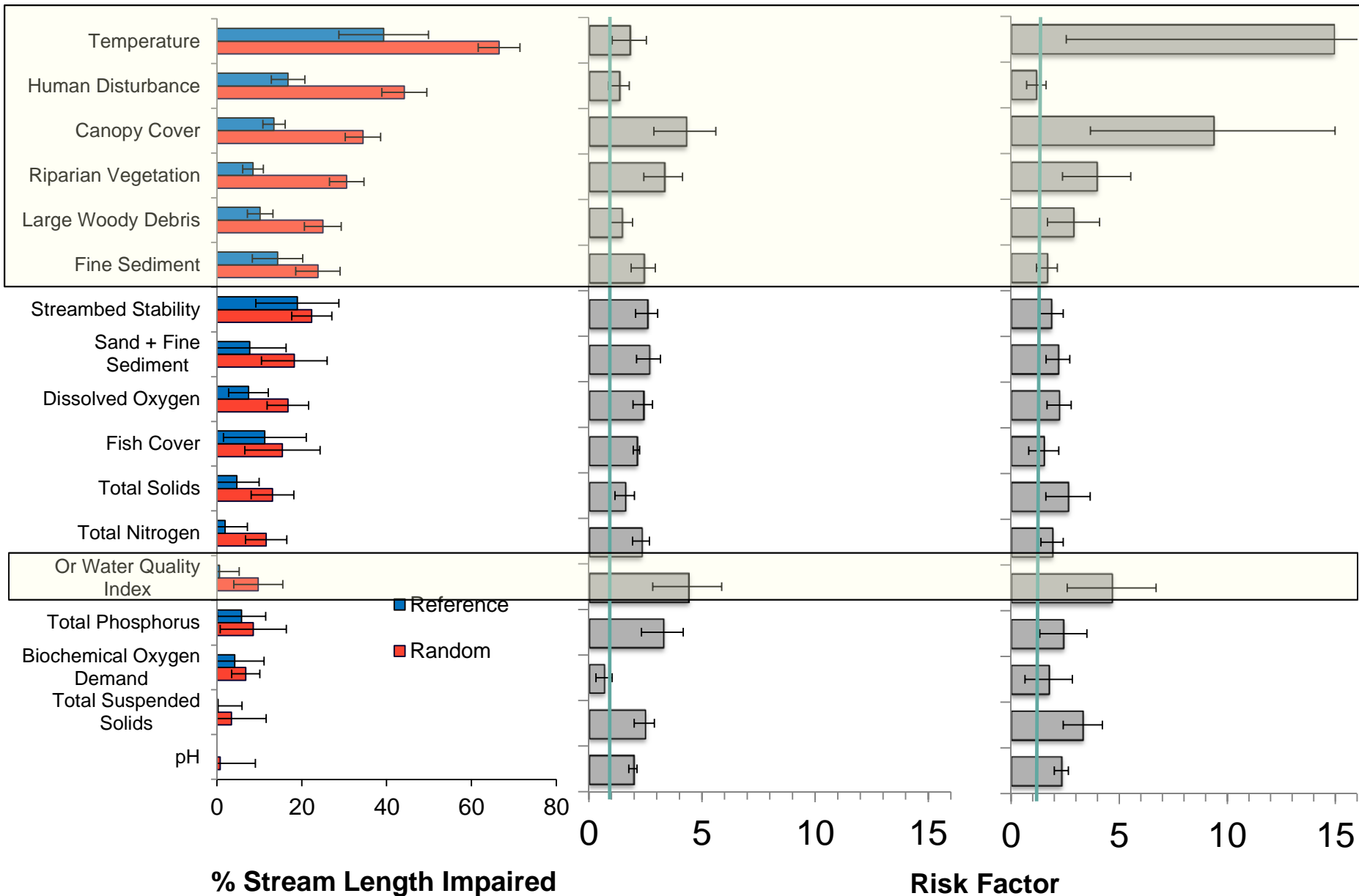
% of Stream Length

# Basin: Stressor Extent

## Relative Risk

Macroinvertebrates

Vertebrates



# Willamette Basin Rivers & Streams Assessment



TUESDAY  
OCTOBER 20, 2009

## The Oregonian

BREAKING NEWS AT OREGONLIVE.COM

WINNER OF SEVEN PULITZER PRIZES

SUN



LEFT | The stream banks on this stretch of Fanno Creek in Tigard's Greenway Park have been replanted to increase shade and better protect the stream from polluted runoff. RIGHT | Two pipes drain stormwater from Main Street in Tigard and nearby rooftops into Fanno Creek. Green roofs and replacing concrete with plants, gravel or other more permeable coverings can help reduce runoff.

## Basin's health in jeopardy

DEQ study finds miles of damaged rivers, yet shows how to repair the Willamette waterways

By SCOTT LEAHN  
The OREGONIAN

The Willamette River basin's miles of streams and riparian areas have just undergone their most thorough checkup to date.

Turns out, the patients have some serious health issues.

• Nearly 70 percent of the streams and rivers in the basin are too warm to protect salmon, trout and other sensitive cold-water fish.

• The biological health of more than 80 percent of streams that run through cities and towns is severely compromised, which is bad news for critters from cowbirds to clams.



• Almost half the 11,000-plus miles of streams in the basin have a shortage of tree cover and streamside plants, leaving riparian life by brooding water temperatures, erosion and water pollution.

These figures come from a new Department of Environmental Quality assessment that sampled 430 sites throughout the valley, consolidating work done by government biologists, watershed councils and Oregon State University researchers.

The diagnosis isn't entirely grim. Streams on far-flung lands used in the basin, are in relatively good shape. So are rivers and streams in relatively unpopulated areas.

Issues are WILLAMETTE, Page A4.

### Healthy river

**Canopy** - Shade from trees helps keep water cool.

**Complexity** - Fallen trees attract insects, create refuges for fish.

**Shrubs, trees** - Plants along riverbanks hold off silt and pollutants.



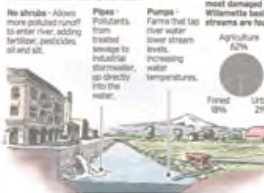
### Damaged river

**No trees** - Sun can heat up the water.

**No shrubs** - Allows more polluted runoff to enter river, adding fertilizer, pesticides, oil and silt.

**Pipes** - Pollutants from treated sewage to industrial effluents, go directly into the water.

**Pumps** - Farms that tap river water lower stream levels, increasing water temperatures.



## Feds back of on prosecuti medical pot

Drug laws | Attorney general says agents have more important things

By JOHN MEYER  
The OREGONIAN

The Obama administration told federal aid day not to arrest or prosecute medical marijuana suppliers, paving the way for some states to with plans to create officially sanctioned dispensaries to provide the drug as relief for various ailments.

The move by the Justice Department ended months of uncertainty about how far the Obama White House planned to go in reversing the Bush administration's federal stance on the controversial issue. The previous administration held that authorities should continue to enforce federal drug laws even in states with laws on the books.

In new guidelines circulated Monday, the most told prosecutors and federal drug agents more important things to do than to arrest people they are obeying the laws of states that allow it of medical marijuana.

The move clarifies what some critics had feared was a shift in federal policy.

Please see MARIJUANA, Page A4.

## Karzai expect to agree to run

Election | A re-examination of the Afghan president nearly 11 months

By KAREN DAYTON  
and JOSHUA FANTON  
The OREGONIAN

WASHINGTON — Obama administration they expect President Hamid Karzai to announce he will accept a runoff in Afghanistan despite losing the investigation of nearly a million of its constituents investigating fraud in the Aug. 20 election.

The findings by the U.S.-led International Commission, released Monday after two months of work, crippled Karzai's claim of a landslide victory below the halfway point and triggering a tightly contested second round of voting between Karzai and rival Abdullah Abdullah.

Senior administration officials, while praising what they said had been an apparent honest negotiation with Karzai, remained cautious about whether he had agreed to a runoff.

"There are any number of delays you could find one official who spoke on condition of anonymity until the chickens are hatched."

Please see ELECTION, Page A4.

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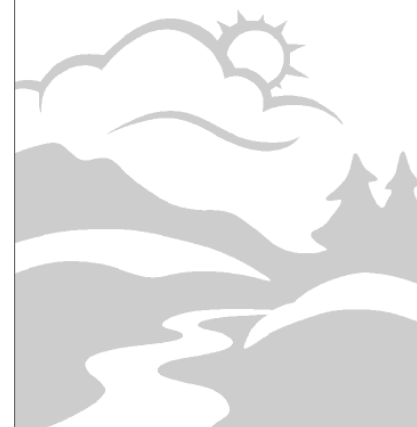
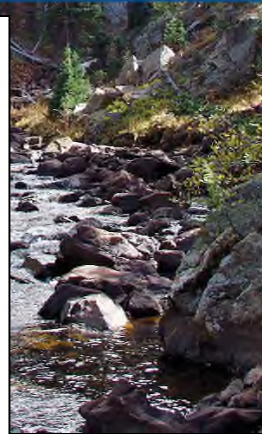
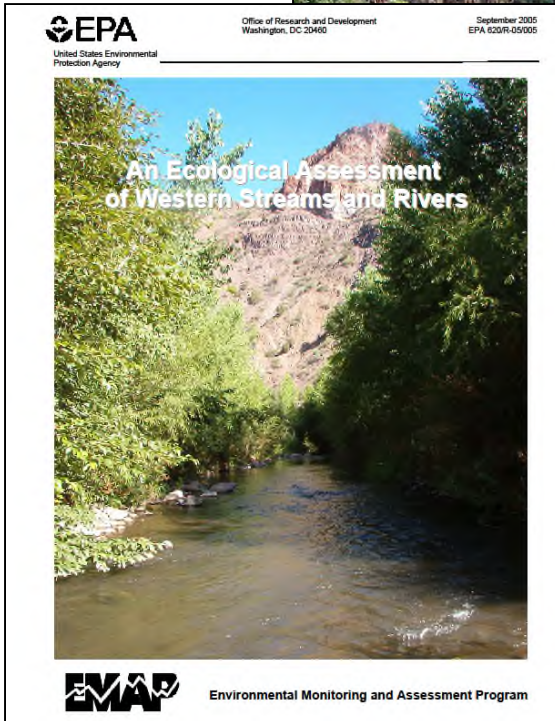
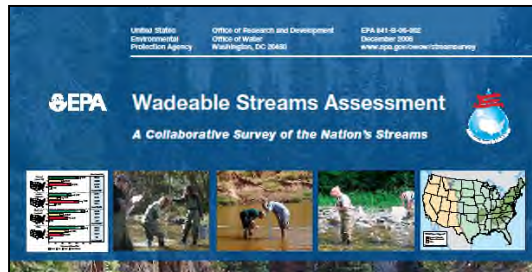
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[www.deq.state.or.us/lab/wqm/assessment.htm](http://www.deq.state.or.us/lab/wqm/assessment.htm)

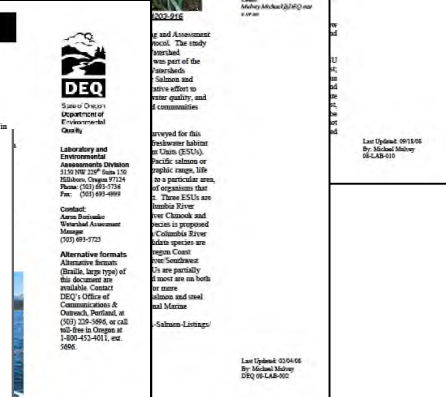


## Related Reports

*available on DEQ and EPA web sites*



Last Update: 06/26/2009  
DEQ/LAB-004-176  
Version 1.1  
Web path: 16-LAB-00





## *Thank You*

### **Survey Design**

- Don Stevens, OSU
- Tony Olson, EPA
- Phil Larsen, EPA

### **Training & Equipment**

- Bob Hughes, OSU
- Phil Kaufmann, OSU
- David Peck, EPA

### **Data Sources**

- Bob Hughes, OSU
- Allen Herlihy, OSU
- Dave Peck, EPA
- Marlys Cappaert, SRA
- Curt Seeliger, SRA
- Chuck Hawkins, USU
- Ken Roley, City of Salem
- Chris Prescott, City of Portland
- Cindy Theiman, Long Tom Watershed Council

### **Data Analysis**

- Don Stevens, OSU
- John Van Sickle, EPA
- Thom Whittier, OSU
- Bill Gaeuman, OSU
- Shannon Hubler, DEQ



## **Dedicated to the memory of Robin Leferink 1979 -2013**





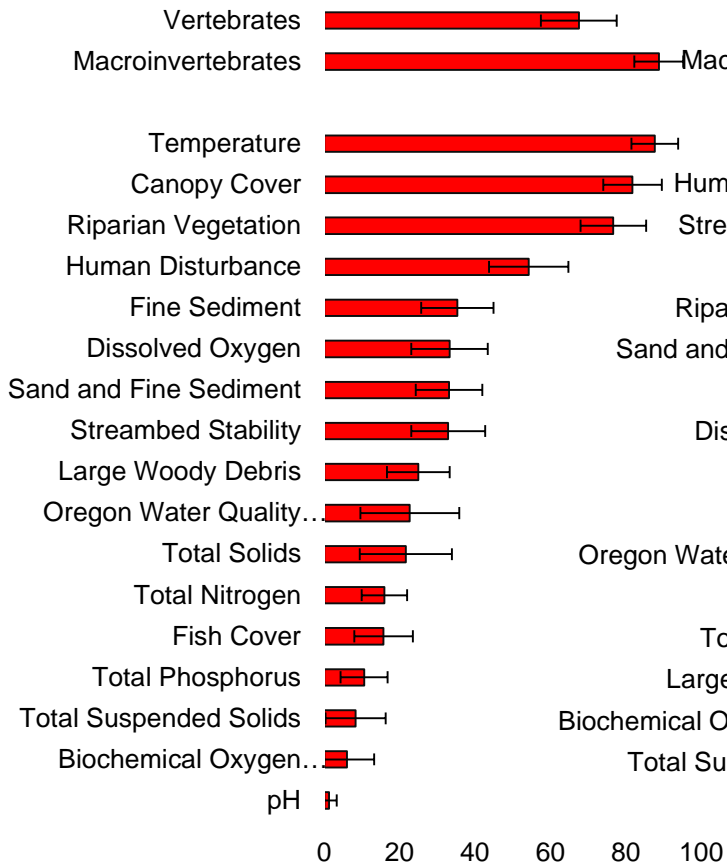
Muddy Creek in the Finley National Wildlife Refuge

[www.deq.state.or.us/lab/wqm/assessment.htm](http://www.deq.state.or.us/lab/wqm/assessment.htm)

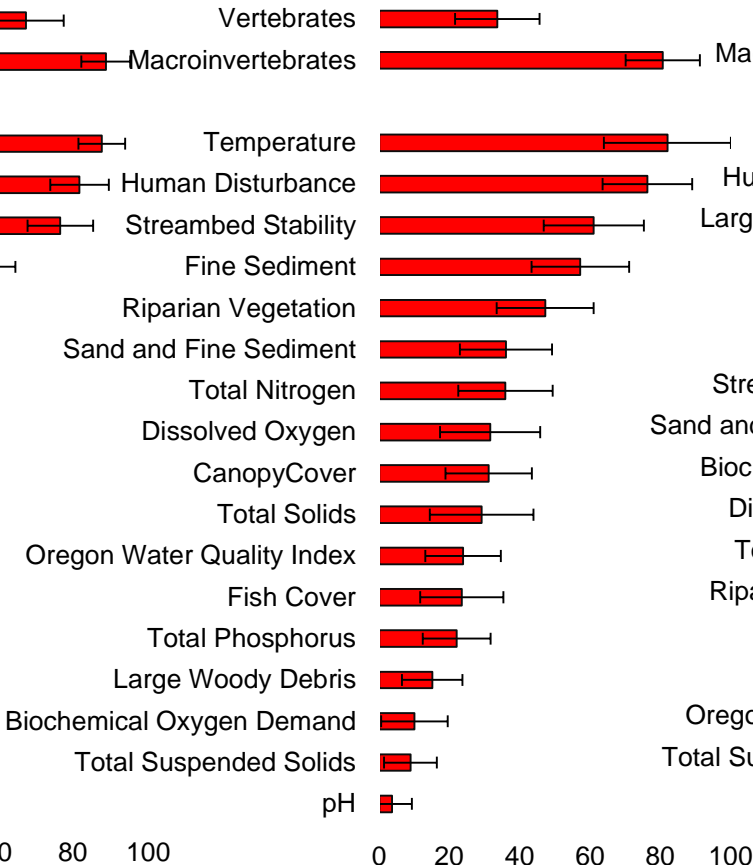
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## Major Land Uses

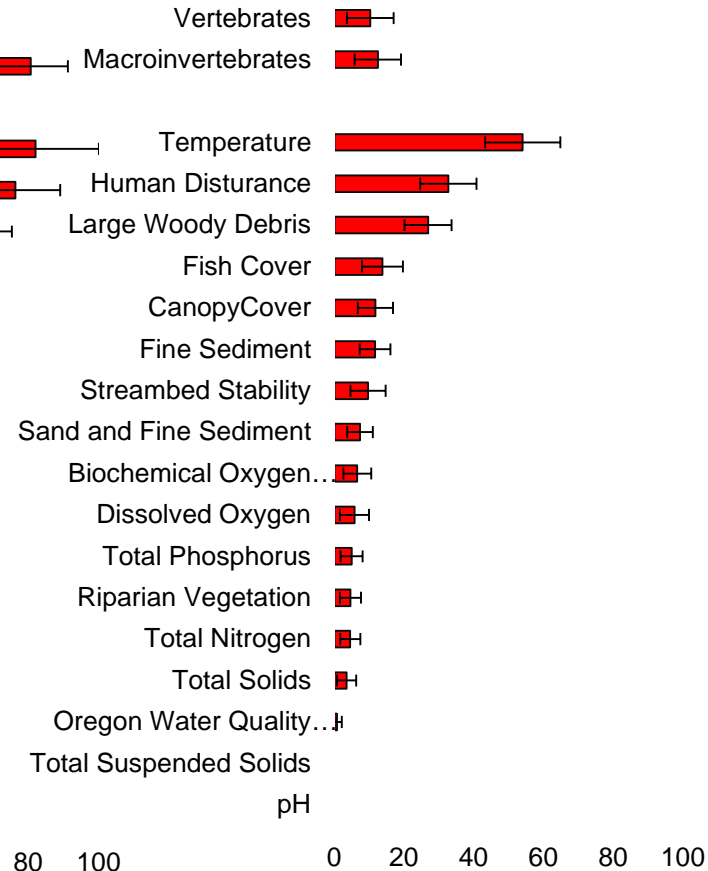
### Agricultural Impairment



### Urban Impairment



### Forest Impairment



% of Stream Length



## What is the Oregon Water Quality Index (OWQI)?

- The index was developed to create a simple and concise method of evaluating the water quality of Oregon's streams.





## What water quality parameters make up the OWQI?

- The index combines eight water quality variables into a single number:
  - Temperature
  - Dissolved oxygen (DO)
  - Biochemical oxygen demand (BOD)
  - pH
  - Ammonia + nitrate nitrogen
  - Total phosphorus (TP)
  - Total solids (TS)
  - Bacteria (*e.coli*) formerly fecal coliform



OWQI scores (10-yr means) for Willamette mainstem sites

